

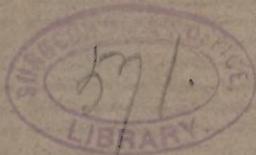
MILLIKIN (D.)

A STUDY IN CREDULITY

By

DAN MILLIKIN, M. D.

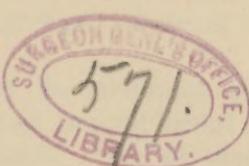
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A STUDY IN CREDULITY.

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HAMILTON.

President Ohio State Medical Society.



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A STUDY IN CREDULITY.

Primeval man, the child, the degenerate—these are all superstitious in high degree. Particularly is this true of the savage. Each thing in nature that can attract his notice is or contains a spirit, and it is not alone the grand and beautiful, the cloud, the cataract, the rainbow, the forest, the ocean, the thunder, which the savage personifies, but little trivial things as well. Witness the medicine-bag or the amulets worn commonly by savages and sometimes by Christians; they consist at best of a poor picture and a few words, a bunch of hair, an odd-shaped bit of stone or wax, a bean of curious color, and so on.

This reveals mind in its credulous stage—a state which knows nothing to be beyond belief; and I place it opposed to the scientific state of mentality which challenges all things, and accepts nothing without rigorous proof leading up to demonstration or to strong probability. The first state is primitive, appertaining to the childhood of the individual and of the race, and it is the state to which the degenerate man reverts; the questioning, skeptical, scientific mental attitude is one which, on the contrary, belongs to man in his highest racial development and his full personal health.

In all rude times and all early stages of development, the superstition of man has found its food in human disease, and naturally so ; for, if anything attracts man's attention as strange and out-of-the-way, it is his departures from the normal standard of health ; and it is perhaps essentially probable that men and women of simple mind should develop a poetic theory that disease is a spirit at work within the body.

With such doctrine as this (and it is not long before the vague superstition becomes definite doctrine) comes treatment which is not altogether illogical. The savage doctor, the medicine-man, prophet, priest and conjurer (for all these functions are confused and blended in rude society), addresses his practice to the casting out of devils, or demons, or half-personified morbid influences. With rattles and drums and dreadful vocal noises he seeks to frighten the evil spirit from its victim, and sometimes, doubting his own endurance, he calls upon neophytes or fellow-tribesmen to assist by relays. The patient's poor carcass is subjected to the most intolerable physical abuse, not because the master of the incantations is cruel or spiteful, but because he has a more or less defined belief that it must be made the unfit habitation for the maleficent spirit which induces sickness.

In a little higher state of civilization, our state, for example, the medicine-man outgrows gross fetishism, and leaves the crass credulity to the patients, while he enters a realm of certitude. And small wonder is it if the doctor's emancipation is not complete. The influence of his patients is particularly degrading, for to most of them there is still present the savage conception of a personal spirit behind every morbid manifestation, and it is a strong mind which can stand alone and not finally be influenced by the notions of those among whom he works. This thought comes to me

often when I hear of a patient speak of his disease as "it." One says, "it" left the stomach and went to the brain. We often hear that "it" struck in with the most serious results. I have been called out of bed to see a patient who was awakened with a numbness of the toe, and straightway sent for his brother, his doctor and his priest, lest "it" should creep up to some vital organ and send him to the realm of shades in shameful informality. And very recently I saw a poor creature with a slowly failing heart and swelling legs, who with the tincture of iodine had painted a garter about her leg in the vague hope that this might prevent "it" from crawling up to drown her.

I really think that some such idea is the underlying principle which leads to the use of cataplasms, liniments and salves applied to the skin for the relief of internal disease. Whatever the doctor may think, the patient thinks that these applications are to drive "it" from its prey.

And while we are generalizing, we may assume that Hahnemann, who was by no means a monster nor a simpleton, was led into his fantastic conception of one morbid principle for all diseases, *psora*, as he called it, by the continued pressure of his patients' impressions. And I think that we may, in charity, declare that the same impression, not recognized or expressed, is derived from the public and reflected upon people of intelligence and authority above the common herd, until, under the tremendous pressure of flattering local public opinion they become healers of one sort and another—faith-curers, prayer-curers, mind-healers, Schlatters, Schaffers, and the like. There is in the public, and finally in the performers, a misty hope that in some occult way the mysterious person or the holy person will drive out the wicked morbid something which makes disease.

Even in health the untrained imagination of the average man is apt to run away with his judgment, or, not to be ungallant, let us say with *her* judgment. To him, to her, the worthiest things are the mysteries of life; what lies within commonplace experience is simply vulgar; what is on its face preposterous and incredible is yet, to the unscientific mind, most likely of all; for to the untrained, unscientific mind, likelihood is only a little province in the beautiful land of ought-to-be. Hence the power of nostrums and the perennial charm of plain vulgar quackery. The average woman knows that she ought to be an object of interest, and hence slightly amiss in her pelvis, and it follows that somewhere in the cultured Eastern States there ought to be, and hence there is, a calm, benevolent Lydia Pinkham, who was herself highly interesting and slightly diseased until she made a discovery of a medicine that is good for all women, and so was restored to placid beauty. And the citizen of average constipation feels that there ought to be, and hence there is, a highly chromatic maiden in the beautiful sunset land of California who reaches for figs for the relaxation of the nations, while the Prussian-blue Pacific Ocean wimples behind her in orthodox manner. The commercial traveler feels that there ought to be, and hence there is, a damiana wafer able to support him when he is about to get into trouble, and a snaky specific of three serpentine S's, or a five-day "Zip" to restore him to usefulness after trouble has come. To the average patient there ought to be many more things true, and, because they ought to be true, they are true for the dreamer. There ought to be clairvoyance, supersensuous insight or spiritual vision, or metaphysical powers to aid specially gifted ones to see by the mind's eye the internal diseases of men and women, without the coarse methods based upon the tactile sense or the eye of sense, or

common sense. There ought to be a drug-essence, or drug-spirit, or drug-soul, remaining long after the drug itself has been diluted to the vanishing point, and because it ought to be so, it *is* so for fools and the old-time homeopaths. And on the other hand there ought to be great virtue in strange medicines, and they should have power in proportion to their outrageously bizarre characters.

We hear this stuff year in and year out; we breathe it; we weary ourselves resisting and explaining, and presently we cease to protest. Comes there ever a time when we are ready to assume the mental attitude of the mass? Have you yielded? Have I?

The barbaric doctor was certainly a professor of demonology; the doctor of the civilized state has every sort of invitation and pressure to return to that sort of practice. The error that is involved in the assumption that there is a sort of demoniac possession in every case of disease, dies so hard that it has persisted among the most enlightened physicians down to very recent times. It was the basis of treatment two generations ago. Bleeding was but an attempt to open the gate and let the evil thing flow out. Purging and vomiting had the same logical justification. Intolerable drugs were put into the body, up to very recent years, with a more or less definite idea of making it untenable to any other spirit than the owner, and the practice was carried so far that it was oftentimes a very nice question whether the landlord of this house of clay—the Ego himself—had not better move out and find quieter quarters on the other side of the street. For many years no excrement, no carrion, no parasites, were too disgusting to be swallowed upon a shadowy theory that they would expel the incarnate morbific principle. At its worst this sort of practice has disappeared, and there is only one dainty “school” of medicine which administers menstrual,

leucorrhæal, venereal, and purulent discharges internally, and which saves some small shreds of pretense to super-elegance by great attenuation of the poisonous filth, like the poor girl who admitted that she had borne a fatherless baby, but pleaded in extenuation that it was such a little one !

Ah, well ! let us not rail overmuch against our homœopathic friends. Many of us give cod-liver oil, and a very few of us still use castor and musk and valerian and asafetida; and, since this address is not debatable, I venture to remark that not one of these substances has any notable character save a vile stench.

And I would greatly desire to have a one-sided debate with the surgeons. They are not far from a belief that even a wounded patient needs some sort of a charm or exorcism, and your surgeon, dear man, carries his voodoo in a dredging-box and calls it—iodoform. Converse with him about this drug, and note his peculiar psychologic state. He doesn't precisely say that it is a lucky thing to use, though that is in his heart of hearts ; he merely says that it finds its place in the most modern treatment of wounds. He will not say that it is an efficient bactericide ; it is too easy to drive him from that ground. And few will say, nowadays, that a wound needs a bactericide when it comes to dressing. Press your surgeon hard enough, and he will tell you that iodoform slowly gives off iodine in the wound, or on its edges; but he will not tell you why it is better than other substances which do the like, nor will he impart to you a reason why he does not use iodine itself in known quantity. Sometimes he wisely calls it an alterant, and sometimes a famous cicatrisant, but he never tells, and never can tell what there is to alter in a wound, nor why it should be altered, nor will he admit that he operates to procure a cicatrix nor boasts of the cicatrix after healing. Take him off his guard, and he

will declare that the surgeons have developed the fact that any foreign body or drug is an impertinence when applied to a wound during or after operation; and yet, as a dyspeptic dog returns to nutriment imperfectly chymified and regurgitated, so your surgeon returns to his fetish, and will return to it as long as it retains its laboratory odor to impress all who handle it or suffer it. I make no doubt at all that the use of this druggiest of drugs indicates a survival of credulous, superstitious mental habits which have persisted from the time when surgeons sought to cast out something morbid and actively malignant.

When the medical profession of Europe had worked out the humoral theory of the genesis of disease, it had struck out a most useful hypothesis which included and systematized a great number of facts. And yet, as it was received and adopted for absolute truth, it was only a higher form of personification of the morbific principle, for it substituted a vague and shadowy entity for the half-corporeal demon which had haunted pathology for so many centuries.

We do much better now. We have a pathology of the zymotic diseases which is harmonious and strictly scientific, and conformable to the true spirit of induction. But it falls in my way to say, to-day, that it is not at all to the credit of our craft that the old credulity breaks out anew with every announcement of progress in bacteriology; greedy, gulping acceptance of principles, unproved and half-proved, in bacteriology is the disgrace of the day; most of us have been obliged to change front three times on the bacteriology of diphtheria; and it is certain as death and taxes that we shall play the jumping-jack through future years if we do not, after the manner of scientific men, receive valuable hypothesis as hypothesis.

And while we are making disagreeable confessions, it

may be well to say that there is now raging in the profession a pestilence which is somewhat analogous to the nostrum-frenzy among the laity. If it were manly to shuffle and find excuses for this, we might cite, as the inducing cause, the greed of manufacturing druggists, who are not content with legitimate profits from the preparation and marketing of legitimate drugs, and who are by many devices cultivating the notion that they have each a monopoly of the stock of this or that drug or compound of drugs, and especially that they have each a monopoly of the knowledge requisite for the compounding of some "special preparations." As I look back over the vista of a number of years, it appears to me that the beginning of this evil in its present phase was the great success of Fellows' Compound of Syrup of Hypophosphites. It was pushed upon the profession by the most skillful advertising, and it was slyly presented to the attention of the laity as well, though not in a manner very offensive to the profession, and its success as a money-maker was known to be very great. Two evils adhere to it: firstly, the manufacturers pretend to be making it under superior secret methods so that no one outside of their laboratory can even imitate it; and, secondly, the physicians who use it, take it as it is, without even a pretense that they know the names or the doses of its several ingredients.

It has its imitators by the dozens and hundreds. Not only does every manufacturer put forth a Syrup of Hypophosphites, secret and superexcellent, but each drug firm is sending out hundreds of similar quack preparations representing or purporting to contain many valuable drugs. And there is every evidence that the trash is bought in enormous quantities by physicians. It is only a short time since a gentleman who visited me for years, selling me most excellent pills of the honest drugs, came into my office with a new sample-case filled

with the preparations of one firm sold under trade-marks. He had "Respirazone," to cure asthma; "Nepenthe," for the relief of flux, diarrhea, cramp colic, cholera morbus, congestion and neuralgia of the stomach and bowels, cholera infantum and sour eructations; he had "Nephritica," to cure all diseases of the bladder and kidneys, including chronic albuminuria, and incidentally it relieved "dragging sensation in end of the penis," and "dragging sensation in testicles and ovaries"; he had an "Elixir Iodo-Bromide of Calcium Compound," which would cure more diseases than I can tell you of; he had "Diphtherine," which by its terminal syllable might be an alkaloid, but is not; he had the Tilden Company's "Wine of Wild Cherry, Fer-rated," which would cure most diseases if given long enough; he had "Maltopepsine" and an elixir of the same, and tablets too, and certificates from Indian Territory to Vermont, including a few from college professors; he had two Syrups of Hypophosphites and a "Hematonic"; he had the Tilden Company's "Beef, Iron and Wine," and, better yet, he had "Beef, Iron and Rye"; he had a "Calisaya Cordial"; he had a "Firwein"; and he had a half-dozen more, some protected by trade-marks and some not. This salesman was one who had been selling legitimate drugs in the form of pills for many years, and he told me that he was working for the quack firm at an advanced salary, and that he was selling oceans of their special preparations. He was only one of thousands.

And the abominable infection is spreading. Only a short time ago a very able physician asked me if a patient we had been treating in common had not better take a ferruginous tonic for a short time. I agreed, and asked him his preference; he lightly said, "Oh, give him some one of the newer forms of iron." I inquired further, and found that he had a quack prepara-

tion in mind, and when I spoke lightly of it he looked on your President pityingly, as one looks on an imbecile. From a Southern State a bright young doctor sends me word of one of my old patients who is slowly dying with a senile heart ; he is treating the old gentleman as well as he can, for he is giving him somebody's "Elixir of Three Chlorides," though neither he nor I know what three chlorides, nor what the dose may be, nor what the three several indications may be. He also is one of thousands, for it is not too strong a statement to say that the whole American medical profession have gone daft over these preparations of the manufacturing pharmacists, sold by pure impudence and bought by the doctors through pure credulity. St. Louis is the headquarters of this shameful traffic, but every city and many of the small towns have their firms, all intent on getting rich through mystery and loud pretense.

Has the doctor or dentist need of an antiseptic ? Surely he ought to be able to make his selection among the known antiseptic substances, or to make a compound, if that were wise ; but it is ten to one that he will resort to some compound put forth through the avenues of trade under a taking name ; he will resort to "Listerine," or "Borolyptol," or "Sennine," or a dozen more.

Is an alterant needed ? Instead of using one well-known drug, or peradventure two, in proper form and dose, the modern doctor looks to St. Louis again, and buys a mixture of unknown composition called "Iodia" ; or he finds some of those already named thrust into his hand ; and our neighbor, Indianapolis, has the "Succus Alterans," with certificates good in Coohatchie, Columbus, or London. Aye, and there is "Arsenauro," most mysterious of all, always advertised on the outer cover of the *Journal of the American Medical Association*.

Has he need of an hypnotic ? St. Louis is to the front again with "Bromidia."

Has he a patient with a disease of the bladder? Diagnosis is not worth the time it takes; any drug firm can give him a sure and secret "Diuretic Elixir"; St. Louis offers him "Lithiated Hydrangea," to cure all diseases of the bladder; and elsewhere he may obtain "Sanmetto," better than any.

Is the American doctor in need of a coal-tar derivative, antipyretic, analgesic and antiseptic? We have some good ones of known chemical composition and well-studied physiological reaction, but St. Louis presents the doctor with so many pocket-books and slates and pencils and so much literature that he takes his "Antikamnia" quite forgetful of the fact that it is easily proven to be a rascally, dirt-cheap mixture, and no definite chemical compound at all.

It is the special object of this address to call your attention to the fact that these so-called special preparations do not differ in any regard from the patent medicines which are swallowed in such quantity by the laity to feed the inextinguishable laughter of the doctors. It is not in order for you or me to sneer at the girl who buys love-powders in the kitchen, or madame who buys subscription-books in the parlor, if we, snickering in the office, are seduced by the drummer's smooth tongue into the purchase and use of secret remedies. The farmer buys seed oats at extravagant prices, and it pleases the medical profession mightily to dwell upon his disappointment when harvest-time comes and the farm and barns are not quite buried out of sight by the promised avalanche of grain. We have our fun with the poor deluded victims of the shell racket, the bunco games and the gold-brick investment. Indeed, yes; we read the papers; we have heard the chimes! But shall we not curb our mirth and our affectation of superior wisdom if we use the much-advertised stuff which is piled upon our tables? For are they not simply proprietary

medicines and patent medicines ? I am told that the formula is on each bottle. The formula, indeed ! The Egyptian sphinx has a very open countenance, yet the ages have not wrested her secret from her. The Grecian oracles were plain enough ; even I have parsed them ; but no man could say what they might mean until the fullness of times had come. The formula on each bottle ! Spare us such formulas in the kitchen ; for if the cook has only the names of her ingredients hinted to her, "combined with aromatics," she will never be able to concretely realize the theoretic difference between pudding and bread, or between plain omelet and baked custard, and the only certainties she will deal out to us will be dyspepsia and consuming wrath. And so the formula on each bottle of quack medicine compounded for credulous doctors, palters with us in a double sense, and carefully conceals what it pretends to reveal.

The advertising of this sort of stuff has become a curse almost unbearable. To say nothing of the pestiferous dudes who visit the doctor in unending procession, dribbling out their parrot phrases and cumbering the earth with their samples, one may be permitted to say that the morning's mail has become a burden to the doctor and to the postman. The Postmaster-General stated officially to the Congress now in session that he carried, each year, nearly 133,000 tons upon which postage is paid at the rate of only one cent a pound, and he has the figures to prove that it costs the Government about eight cents a pound to carry it. It follows that the actual loss to the Government in handling its second-class mail is more than \$18,500,000, or an amount greater than one-fifth of the entire postal revenue. While he favors the carrying of honest newspapers at losing rates, he yet cries aloud for legislation which will enable him to exclude "an immense and undesirable

mass of additional matter," which, as he well says, was never dreamt of by the framers of our postal laws, and which fairly swamps the post-office. A very large part of this stuff consists of advertisements sent to physicians, and the impudence of the advertisers rises to its superb climax when they put forth what appear to be journals, even daily journals, as in the case of the Paskola people, and send them out broadcast as "sample numbers," postage free!

And the influence of these trashy journals is perhaps much greater than we have thought. Their literary and scholarly qualities are a minus quantity. They are mere scraps and shreds, sometimes piled together with some little ingenuity to hold the attention, yet utterly debasing to the reader. Gases behave to each other as vacua; medical journals do not. As a debased coinage will surely drive sound money out of sight and out of a country, so bad literature drives out good literature. Read newspapers four hours a day and you will presently become unable to read history, biography or essays, much less that sort of literature which requires study. Carry over the experiment to our domain and read the "Medical Brief," "The Od Quarterly," "The Doctor's Factotum," "The Daily Lancet," or somebody's "New Remedies," and you may by and by become incapable of reading better journals, much less good medical books. *Facilis descentus*; the road to Hades is of sheet asphalt, slightly down grade; it is an avenue where one may smoothly coast down to the pit of inanity with the aid of the journals of the pharmacists, as they call themselves.

Aye, and let us confess that the legitimate medical press is not without taint. I can show you whole issues of the best journals of our land containing no clean advertisements, such as should accost the physician, with the exception of, here and there, a call to drink pale ale,

to buy trusses or artificial legs, or to go to a private lunatic asylum. All other space is evidently for sale to the highest bidder with the lowest notions of our work, and I shame to say that this low fellow with the long purse evidently buys editorial notices of his secret preparations along with other space.

It were vain for us to indulge in this sort of discourse, chiefly damning criticism, without some thought of a remedy. I will therefore indulge myself in the pleasure of saying to this Society that there is a certain little book called the *Pharmacopœia*. It contains the names of 994 drugs or preparations of drugs. If my confrères gain an intimate knowledge of one-half of these, they will have no time nor use for secret mixtures. This book contains the names of all the definite chemical compounds which have been applied to the relief of disease with the exception of a very few which are patented and are imported from Germany, and sold here under license, as I am sorry to say. It names and describes the preparations of all Galenical solutions of curative vegetable substances. It gives tests for purity and strength so that the physician may test or assay his drugs, or may have the work done for him. What would you more?

The *Pharmacopœia* is the most perfect book known to me. If to me the work of editing it were to be assigned this day, I would introduce some account of the thyroid extract, I would ponder a little space before I admitted any of the toxins or antitoxins, and I would ponder a very long time before I admitted any of the glandular extracts save the one named.

You will please remember that this admirable work is your creation. It was suggested by a physician in 1817; it was put forth in its first edition in 1820. It has been revised, chiefly by your delegates, every ten years. It will be revised again and again to meet expanding knowledge. It is continually open to your criticism;

and each revision is done with due regard to the suggestions of the profession of our country. Do you possess a copy? If not, why not? I submit to you that the number of copies owned and well-thumbed in the State of Ohio should be much greater than the membership of this Society. For, at every point, the Pharmacopœia looks to precision, definiteness, uniformity and invariability in each substance and compound, and it will have nothing of mystery. It takes nothing on trust. It knows nothing of luck. It is a stranger to public opinion artificially coddled. It is scientific. It knows.

If you press me for a further remedy I would prescribe a more careful study of the *materia medica* from the therapeutic side. Take your hat off to the man who teaches that branch in the medical colleges. The young graduates who have time and money for a post-graduate course need not go with absolute unanimity to master the handicraft of surgery; three out of four had better learn something of chemistry first, and of biology afterward. Nor will I hector the young fellows. The old doctors, if I am not making the greatest mistake of my life, need to relearn and unlearn a vast deal about the *materia medica* in its simplest elements. There are superstitions in medicine to be sloughed; there are noble certainties to be attained. Throw away your samples and practice medicine!

And now, recalling the manner and the matter of this discourse, I wish in conclusion to protest that it is not my opinion that ours is a credulous profession, judged as a whole. I mark an evil tendency, without the slightest shadow of a doubt that the tendency will be met and neutralized according to the genius of our profession. It must be so! For it has ever been the proud boast of the doctor that he has dissipated doubt and superstition, and has gone far beyond the bounds of his art to bring cer-

tainty and scientific apprehension to the world. Most anciently Hippocrates was the prime interpreter of nature. After him came Aristotle, a physician and one of a long line of physicians, to develop still farther the knowledge of nature and of the logical processes which pertain to close reasoning. His was the greatest name in all the sciences until times comparatively recent. Through the weary dark ages science was well preserved and most advanced by Jewish and Arabian physicians who formed the noblest aristocracy of all, the aristocracy of intellect, and who held place at the courts of popes and caliphs and Christian monarchs alike, in spite of edicts and bulls. I may name to you in earlier times, Avicenna the Arab, Averroes the Moor, the great Maimonides, father and son, predecessors by long years of Jewish doctors like Rabbi Isaac, who looked after the health of Pope Boniface; Mascha, who was physician to Alfonso of Castile; and Zedekias, who was physician and intimate friend of Charles the Bald.

In early time our predecessors stood for certitude. Full 370 years ago Fernel, a court physician, measured a whole degree across Europe and came approximately to the size of the earth, and established for the common mind the fact that it was a sphere as it had never been established before. And the good doctor did this at a time when ecclesiastical authority had it settled infallibly that the earth was flat, and must needs be flat, so that, according to the Scriptures, all the inhabitants could see the Lord descending through the air!

Aye, we stand for certainty! It was the good and gentle doctor Copernicus who first made the complete mathematical demonstration that the earth was no central body but one of many bodies which revolve about the sun. And it was the wretched Galileo, whom I claim as a doctor by virtue of his five years' study under Casalpinus, who searched the heavens with his little telescope

and took the heliocentric doctrine forever out of the domain of hypothesis. He first saw the valleys of the moon and the spots on the sun, and brushed aside forever the monkish doctrine of the perfection of the heavenly bodies. He saw the satellites of Jupiter—a little heliocentric system amid the greater; he accepted the priestly challenge, and showed the phases of Venus. He saw forty fixed stars in the Pleiades, and, by this astonishing apparition alone, revealed the greatness of the cosmos and the infinite littleness of earth. And finally, nearly three hundred years ago, this gentle and pious doctor laid down the doctrine, which, accepted, would have saved oceans of good blood, that the Scriptures were intended to be solely a religious guide and not as a scientific authority.

The very constitution of the earth was worked out to a scientific stage by doctors of medicine. It was Steno who, two hundred and thirty years ago, laid the ground principles and pointed out the distinction between rocks which contained organic remains and those which contained none. Only a few years later, when the churches all held it to be impious to hold that there was any plan to the rocks, an English doctor of medicine brought forward the startling proposal that a colored geologic map of England should be made. It was our Doctor Hooke, who, in 1780, made clear the geologic results of elevation of the bed of the sea by movements not miraculous. Sixty years before this, Vallisneri, a student of Malpighi, had composed a noble treatise on the new science. There was our splendid, modest Doctor Daubenton, "the eyes of Buffon," who, about this time, overthrew the monkish doctrines that certain great tertiary fossil bones found in France were the bones of giants alluded to in the Scriptures. Werner, of Germany, who was not a doctor, more than a century ago (plainly endeavoring to save the Noachian deluge to science) pro-

pounded a theory of the formation of the oldest rocks by water; but our Doctor James Hutton, of Scotland, stood for truth and certainty, and showed not only that the oldest rocks were igneous in their character, but he actually made igneous rocks by great heat and pressure, whereupon the air became black with sermons again. And no list of the fathers of geology is complete without the name of the French doctor, Guettard, who, while making great discoveries, incidentally laid the foundation of the pottery manufacture in France, and showed the people that geology was a science with practical bearings. And there are great names connected with the study of fossils which I repeat to you almost reverently, the names of five great doctors of medicine—Lamarck, whom we regard as the forerunner of Darwin, Sir Everard Home, Bichat, Daubeny and Agassiz. As for the mineralogical side of geology, all must admit that from Avicenna, who eight hundred years ago made the very first recorded attempt at a classification of minerals, there was no mineralogy of note which was not worked out by doctors of medicine. I name only Avicenna, Von Bremel, a pupil of Boerhaave, Haenckel, the immortal Doctor Linn, whom we know so well in botany as Linnaeus, Fuchs and his pupil Mitscherlich, and last of all, Doctor Wollaston, who gave the goniometer with which all mineralogists measure the angles of crystals.

I have mentioned Linnaeus, and his great name reminds me that while he was the greatest he was not the only great doctor of medicine who developed the science of botany. Call the roll. Here are Cæsalpinus, who made the very first classification, Brunfels, Camerarius, Tournefort, Boerhaave, DeCandolle, Schleiden and Swan, and Jussieu. And if you run down the list of plants, you will find by the names of the first describer attached, that the hard work of botany in field

and forest has also been done by doctors of medicine, and right proud am I to place near the head of this group our own Daniel Drake.

In the widest fields of biology we find that the doctors have brought order out of chaos. I again invoke the great name of Aristotle, and following with the name of Paré, I stir your imagination and your pride by the mention of Pallas, Oken, Haller, Ehrenberg, John Hunter, Owen, Huxley, Forbes, Leidy, and mightiest of all, Darwin. The list to be complete, needs that I should again call the great names of Lamarck, Linnæus and Agassiz.

In the field of psychology, which I regard as a branch of biology, the doctors of medicine have warned off the theologians with their prepossessions and the metaphysicians with their intuitions and introspections and cock-sure deductions. We have shown psychology to be an experimental science, and have made it a doctor's science in very truth.

If this is an age of electricity, thank Doctors Galvani, Wollaston, Hare and Oersted for laying down ground-principles.

The grand generalization that force is molecular motion, and that forces are convertible and indestructible, was crudely dreamed by some Greek doctor, I warrant, for it was known after some fashion to Aristotle. Much more plainly it was set forth by good Dr. Galileo, and then through the progress of the years it was developed by Hooke, Papin, Young, Black, Oken, Mohr, Mayer, Carpenter, Helmholtz, Liebig and Seebeck, all doctors of medicine. Who else? No one else, if we except Grove the lawyer, who summed up what had been done, and Joule, the brewer, who determined the mechanical value of a given unit of heat by costly and ingenious experiment. With the exception of these two men the principle that force is molecular motion, and the allied prin-

ciples of the correlation and conservation of force, have been worked out by doctors of medicine. What other fraternity can boast of introducing so much of certainty into man's thought and life?

And turning to chemistry—which we cannot now separate from molecular physics—to chemistry, the most certain of all sciences, we observe that it was a doctor of medicine, Sylvius, who first clearly set forth the poetic and profitable conception of chemical affinity, and, as early as 1718 Geoffroy, another physician published tables of chemical affinities. Working on another line, Cardanus noticed the increase of weight in bodies which rusted in the air, Becher and Stahl followed with similar observations. Van Helmont came to a proper conception of the nature of a gas, Black found fixed air in the carbonates of the alkalies. These were all doctors of medicine, and they had perfectly prepared the way for Priestley and Lavoisier to discover oxygen and to comprehend the nature of oxidation.

Certainty! Yea, verily, the doctors of medicine have not only developed all the sciences but they have penetrated the uttermost corners of the earth; our profession has been represented in Africa by Dr. Livingstone and Emin Pasha, and near the pole by Doctors Kane and Hayes, and shoals of explorers over all the world.

It was Doctor Myer who first showed that the weather was the result of far-away causes, produced not by local influences nor by the wrath or approbation of the All-father. When people speak of "Old Probabilities," they render unconscious homage to our profession, which, upon the scientific collation of facts, evolves laws and makes predictions.

I protest, then, that there is no room for your orator to doubt that ours is an eminently scientific profession; and I here breathe a fervent wish and a hearty belief that, in spite of recent lapses which I have endeavored

to point out to you, ours may continue to be characterized by an insatiate desire to accumulate facts, a power of orderly collation, a poetic invention of hypotheses, a rigid testing of each hypothesis to the intent that truth may be evolved.

At this sitting our Society mourns the loss of two of its most eminent members, Scott, of Cleveland, and Comegys, of Cincinnati. I know of one, and I hear of the other, as a man of integrity, self-poised, modest, learned in and out of our profession. I suspect that they were as far asunder as the poles in many regards; one was bold, positive, fearless, swift to meet peril half-way, masterful in the stress of emergencies, patient and enduring when stubbornness could win. The other was a physician of perhaps gentler metal, who approached each case of internal disease as if it were a problem submitted to the wit of man for the first time since the world began. I have seen him spend much time in the careful study of a pauper's case, and do this over and over, day after day, not permitting himself or his students to make anything more than a tentative diagnosis until at least one hypothesis was demonstrated absolute truth. Then, at last, came a proud day of certainty when the physician of Cincinnati had, by observation and exclusion, led his class to certainty. God send us more men like these! While you give honor to their names and their memories, I beg that you will honor also that which they had in common—their clear and exact knowledge, and their instant challenge of all that was not clear and exact. It is the fervent wish of your orator that they may have many successors in the noble cities which they adorned, and in the State at large, and that the credulous marshmallow doctor may be crowded out by the typical doctor who doubts, and labors to attain certainty beyond doubt.

